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MPI Libraries

SGI MPT

DRAFT

This article is being reviewed for completeness and technical accuracy.

SGI's Message Passing Interface (MPI) is a component of the Message Passing Toolkit (MPT), which is a software package that supports parallel programming across a network of computer systems through a technique known as message passing. It requires the presence of an Array Services daemon (arrayd) on each host to run MPI processes.

SGI's MPT 1.x versions support the MPI 1.2 standard and certain features of MPI-2. The 2.x versions will be fully MPI-2 compliant.

On Columbia, the current system default version is mpt.1.16. A 2.x version will be available when the operating system is upgraded to SGI ProPack 7SP1.

On Pleiades, there is no default version. You can enable the recommended version, mpt.2.04.10789, by:

```
%module load mpi-sgi/mpt.2.04.10789
```

Note that certain environment variables are set or modified when an MPT module is loaded. To see what variables are set when a module is loaded (for example, mpi-sgi/mpt.2.04.10789), do:

```
%module show mpi-sgi/mpt.2.04.10789
```

To build an MPI application using SGI's MPT, use a command such as one of the following:

```
%ifort -o executable_name prog.f -lmpi
%icc -o executable_name prog.c -lmpi
%icpc -o executable_name prog.cxx -lmpi++ -lmpi
%gfortran -I/nasa/sgi/mpt/1.26/include -o executable_name prog.f -lmpi
%gcc  -o executable_name prog.c -lmpi
%g++ -o executable_name prog.cxx -lmpi++ -lmpi
```

MVAPICH

DRAFT

This article is being reviewed for completeness and technical accuracy.

MVAPICH is open source software developed largely by the Network-Based Computing Laboratory (NBCL) at Ohio State University. MVAPICH develops the Message Passing Interface (MPI) style of process-to-process communications for computing systems employing InfiniBand and other Remote Direct Memory Access (RDMA) interconnects.

MVAPICH software is typically used across the network of a cluster computer system for improved performance and scalability of applications.

MVAPICH is an MPI-1 implementation while MVAPICH2 is an MPI-2 implementation (conforming to MPI 2.2 standard) which includes all MPI-1 features.

MVAPICH1/MVAPICH2 are installed on Pleiades, but not Columbia. You must load in an MVAPICH1 or MVAPICH2 module before using it. For example:

```
%module load mpi-mvapich2/1.4.1/intel
```

A variety of MPI compilers, such as mpicc, mpicxx, mpiCC, mpif77, or mpif90, are provided in each MVAPICH/MVAPICH2 distribution. The correct compiler should be selected depending on the programming language of your MPI application.

To build an MPI application using MVAPICH1/MVAPICH2:

```
%mpif90 -o executable_name prog.f
%mpicc -o executable_name prog.c
```